

## Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 10/24/2019

Reviewed on 10/24/2019

### 1 Identification

- **Product Identifier**
- **Trade Name: Carbon Steel Electrodes for Submerged Arc Welding**
- **Product Number:**
  - Specification: A5.17 / A5.23
  - Classification: EC1, EM12K
  - Carbon steel electrodes for submerged arc welding
- **Relevant identified uses of the substance or mixture and uses advised against:**
  - For professional use only. Use according to manufacturer's specification.
- **Product Description:** Carbon steel electrodes for submerged arc welding.
- **Application of the substance / the mixture:** Industry specific application.
- **Details of the Supplier of the Safety Data Sheet:**
- **Manufacturer/Supplier:**
  - SOWESCO I, LLC
  - 9384 Wallisville Road
  - Houston, TX 77013
  - Telephone: 800-856-9353
- **Emergency telephone number:** 713-688-9353

### \* 2 Hazard(s) Identification

- **Classification of the substance or mixture:**



Health hazard

Carc. 1A H350 May cause cancer.



Corrosion

Eye Dam. 1 H318 Causes serious eye damage.



Skin Irrit. 2 H315 Causes skin irritation.

Skin Sens. 1 H317 May cause an allergic skin reaction.

STOT SE 3 H335 May cause respiratory irritation.

- **Label elements:**
- **Hazard pictograms:**



- **Signal word:** Danger
- **Hazard-determining components of labeling:**
  - Iron
  - Titanium
  - Lithium
  - Silica
  - Nickel

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**Trade Name: Carbon Steel Electrodes for Submerged Arc Welding****Hazard statements:**

- H315 Causes skin irritation.
- H318 Causes serious eye damage.
- H317 May cause an allergic skin reaction.
- H350 May cause cancer.
- H335 May cause respiratory irritation.

**Precautionary statements:**

- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe dust/fume/gas/mist/vapors/spray.
- P264 Wash thoroughly after handling.
- P271 Use only outdoors or in a well-ventilated area.
- P272 Contaminated work clothing must not be allowed out of the workplace.
- P280 Wear protective gloves / eye protection / face protection.
- P285 In case of inadequate ventilation wear respiratory protection.
- P302+P352 If on skin: Wash with plenty of water.
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P310 Immediately call a poison center/doctor.
- P308+P313 IF exposed or concerned: Get medical advice/attention.
- P321 Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
- P312 Call a poison center/doctor if you feel unwell.
- P362+P364 Take off contaminated clothing and wash it before reuse.
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P363 Wash contaminated clothing before reuse.
- P403+P233 Store in a well-ventilated place. Keep container tightly closed.
- P405 Store locked up.
- P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**Unknown acute toxicity:**

- This value refers to knowledge of known, established toxicological or ecotoxicological values.
- 36.2 % of the mixture consists of component(s) of unknown toxicity.

**Hazard description:**

- Lithium may explode when in contact with water. Exposure to moist air may result in fire. Lithium can react with water to produce flammable hydrogen gas, which may create a fire and explosion hazard. Spontaneous ignition can occur if Lithium is heated to its melting point. Lithium dusts may ignite spontaneously in moist air. Lithium can react with moisture to produce corrosive compounds. NEVER purge open drums with nitrogen before resealing. Store and transport under argon or mineral oil.

**Classification system:** NFPA/HMIS Definitions: 0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme**NFPA ratings (scale 0 - 4)****HMIS-ratings (scale 0 - 4)**

HEALTH	*3	Health = *3
FIRE	0	Fire = 0
REACTIVITY	0	Physical Hazard = 0

**Hazard(s) not otherwise classified (HNOC):** None known

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### \* 3 Composition/Information on Ingredients

· **Non-hazardous components:**

CAS: 7440-62-2 RTECS: YW 1355000	Vanadium	0-10%
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· **Chemical characterization: Mixtures**

· **Description:** Mixture of substances listed below with non-hazardous additions.

· **Dangerous Components:**

CAS: 7439-89-6 RTECS: NO 4565500	Iron ⚠ Flam. Sol. 2, H228; ⚠ Skin Irrit. 2, H315; STOT SE 3, H335; Eye Irrit. 2B, H320; Combustible Dust	70-99%
CAS: 7440-32-6 RTECS: XR 1700000	Titanium ⚠ Skin Irrit. 2, H315; Skin Sens. 1, H317; Eye Irrit. 2B, H320	0-10%
CAS: 1317-95-9	Silica ⚠ Carc. 1A, H350; ⚠ STOT SE 3, H335	0-3%
CAS: 1344-28-1 RTECS: BD 1200000	Aluminium Oxide ⚠ STOT SE 3, H335	0-3%
CAS: 7439-93-2 RTECS: OJ 5540000	Lithium ⚠ Water-react. 1, H260; ⚠ Skin Corr. 1B, H314	0-12%
CAS: 7440-03-1 RTECS: QT9900000	Niobium ⚠ Flam. Sol. 1, H228; Combustible Dust	0-3%
CAS: 7440-39-3 RTECS: CQ 8370000	Barium ⚠ Water-react. 2, H261	0-9%
CAS: 7440-67-7 RTECS: ZH 7070000	Zirconium ⚠ Pyr. Sol. 1, H250; Water-react. 1, H260	0-12%
CAS: 7439-96-5 RTECS: OO 9275000	Manganese ⚠ Pyr. Sol. 1, H250; Water-react. 1, H260	0-4%
CAS: 7440-21-3	Silicon ⚠ Flam. Sol. 2, H228; ⚠ Acute Tox. 4, H302; Eye Irrit. 2B, H320; Combustible Dust	0-3%
CAS: 7439-95-4 RTECS: OM 2100000	Magnesium ⚠ Pyr. Sol. 1, H250; Water-react. 1, H260	0-1.2%
CAS: 7429-90-5 RTECS: BD 0330000	Aluminium ⚠ Flam. Sol. 2, H228	0-1%
CAS: 7440-02-0	Nickel ⚠ Carc. 2, H351; STOT RE 1, H372; ⚠ Skin Sens. 1, H317	0-0.3%
CAS: 13463-67-7	Titanium Dioxide ⚠ Carc. 2, H351	0-0.3%
CAS: 7440-50-8 RTECS: GL 5325000	Copper ⚠ Flam. Sol. 1, H228; ⚠ STOT SE 3, H335; Aquatic Acute 3, H402; Aquatic Chronic 4, H413	0-1%

· **Additional information:**

The exact percentages of the ingredients of this mixture are considered to be proprietary and are withheld in accordance with the provisions of paragraph (i) of §1910.1200 of 29 CFR 1910.1200 Trade Secrets.

Note: Certain chemical constituents listed in Section 3 may vary depending upon the Classification of the Carbon Steel Electrodes for Submerged Arc Welding products.

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**Trade Name: Carbon Steel Electrodes for Submerged Arc Welding**

### \* 4 First-Aid Measures

- **Description of first aid measures**

- **General information:**

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- **After inhalation:**

Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist. In case of unconsciousness place patient stably in the side position for transportation.

- **After skin contact:**

Immediately wash with water and soap and rinse thoroughly. If skin irritation occurs, consult a doctor.

- **After eye contact:**

Do NOT rub eyes. Immediately rinse opened eye(s) for at least 15 minutes under running water, lifting upper and lower lids occasionally. If symptoms persist, consult a physician. If easy to do so, remove contact lenses if worn.

- **After swallowing:**

Rinse out mouth and then drink plenty of water. Do not induce vomiting without medical advice. If swallowed and symptoms occur, consult a doctor.

- **Information for doctor**

- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.

- **Indication of any immediate medical attention and special treatment needed:**

No further relevant information available.

### \* 5 Fire-Fighting Measures

- **Extinguishing media**

- **Suitable extinguishing agents:**

CO<sub>2</sub>, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam. Use fire fighting measures that suit the environment.

- **For safety reasons unsuitable extinguishing agents:**

DO NOT USE WATER, CARBON DIOXIDE OR SAND. No further relevant information.

- **Special hazards arising from the substance or mixture:**

Amorphous or crystalline silicon both react exothermically when heated with alkali-metal carbonates attaining incandescence and evolving carbon monoxide. Material in powder form, capable of creating a dust explosion. Mixture of silicon, aluminum, and lead oxide explodes when heated.

- **Advice for firefighters**

- **Special protective equipment for firefighters:**

As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

- **Additional information:**

At temperatures above 200°C Zirconium reacts exothermically with the following: fluorine, chloride, bromide, iodine, halocarbons, carbon tetrachloride, carbon, tetra fluoride and Freon's. These items are not reactive, flammable, or explosive and essentially not hazardous at ambient temperatures. Welding arcs and sparks can ignite combustibles and flammable products. If involved in a fire, these products may generate irritating aluminum fumes and a variety of metal oxides. Emergency responders must wear personal protection equipment suitable for the situation. Use the extinguishing media recommended for the burning materials and fire situation. See ANSI Z49.1 "Safety in Welding and Cutting" and "Safe Practices" Code: SP, published by the American Welding Society.

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### \* 6 Accidental Release Measures

· **Personal precautions, protective equipment and emergency procedures:**

Ensure adequate ventilation.

Avoid contact with skin, eyes and clothing.

· **Environmental precautions:** Do not allow to enter sewers/surface or ground water.

· **Methods and material for containment and cleaning up:**

Pick up mechanically.

Ensure adequate ventilation.

Dispose of the collected material according to regulations.

· **Reference to other sections:**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

· **Protective Action Criteria for Chemicals**

· **PAC-1:**

7439-89-6	Iron	3.2 mg/m <sup>3</sup>
7440-32-6	Titanium	30 mg/m <sup>3</sup>
7440-62-2	Vanadium	3 mg/m <sup>3</sup>
1344-28-1	Aluminium Oxide	15 mg/m <sup>3</sup>
7439-93-2	Lithium	3.3 mg/m <sup>3</sup>
7440-03-1	Niobium	30 mg/m <sup>3</sup>
7440-39-3	Barium	1.5 mg/m <sup>3</sup>
7440-44-0	Carbon Fiber	6 mg/m <sup>3</sup>
7440-67-7	Zirconium	10 mg/m <sup>3</sup>
7439-96-5	Manganese	3 mg/m <sup>3</sup>
7440-21-3	Silicon	45 mg/m <sup>3</sup>
7439-95-4	Magnesium	18 mg/m <sup>3</sup>
1317-61-9	Iron Oxide	21 mg/m <sup>3</sup>
7440-50-8	Copper	3 mg/m <sup>3</sup>
7439-98-7	Molybdenum	30 mg/m <sup>3</sup>
7440-02-0	Nickel	4.5 mg/m <sup>3</sup>
13463-67-7	Titanium Dioxide	30 mg/m <sup>3</sup>

· **PAC-2:**

7439-89-6	Iron	35 mg/m <sup>3</sup>
7440-32-6	Titanium	330 mg/m <sup>3</sup>
7440-62-2	Vanadium	5.8 mg/m <sup>3</sup>
1344-28-1	Aluminium Oxide	170 mg/m <sup>3</sup>
7439-93-2	Lithium	36 mg/m <sup>3</sup>
7440-03-1	Niobium	330 mg/m <sup>3</sup>
7440-39-3	Barium	180 mg/m <sup>3</sup>
7440-44-0	Carbon Fiber	330 mg/m <sup>3</sup>
7440-67-7	Zirconium	83 mg/m <sup>3</sup>
7439-96-5	Manganese	5 mg/m <sup>3</sup>
7440-21-3	Silicon	100 mg/m <sup>3</sup>

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7439-95-4	Magnesium	200 mg/m <sup>3</sup>
1317-61-9	Iron Oxide	230 mg/m <sup>3</sup>
7440-50-8	Copper	33 mg/m <sup>3</sup>
7439-98-7	Molybdenum	330 mg/m <sup>3</sup>
7440-02-0	Nickel	50 mg/m <sup>3</sup>
13463-67-7	Titanium Dioxide	330 mg/m <sup>3</sup>
<b>· PAC-3:</b>		
7439-89-6	Iron	150 mg/m <sup>3</sup>
7440-32-6	Titanium	2,000 mg/m <sup>3</sup>
7440-62-2	Vanadium	35 mg/m <sup>3</sup>
1344-28-1	Aluminium Oxide	990 mg/m <sup>3</sup>
7439-93-2	Lithium	220 mg/m <sup>3</sup>
7440-03-1	Niobium	2,000 mg/m <sup>3</sup>
7440-39-3	Barium	1,100 mg/m <sup>3</sup>
7440-44-0	Carbon Fiber	2,000 mg/m <sup>3</sup>
7440-67-7	Zirconium	500 mg/m <sup>3</sup>
7439-96-5	Manganese	1,800 mg/m <sup>3</sup>
7440-21-3	Silicon	630 mg/m <sup>3</sup>
7439-95-4	Magnesium	1,200 mg/m <sup>3</sup>
1317-61-9	Iron Oxide	1,400 mg/m <sup>3</sup>
7440-50-8	Copper	200 mg/m <sup>3</sup>
7439-98-7	Molybdenum	2,000 mg/m <sup>3</sup>
7440-02-0	Nickel	99 mg/m <sup>3</sup>
13463-67-7	Titanium Dioxide	2,000 mg/m <sup>3</sup>

**\* 7 Handling and Storage****· Handling**

· **Precautions for safe handling:** No special precautions are necessary if used correctly.

· **Information about protection against explosions and fires:**

Protect from heat.

Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**

Store away from strong acids, strong bases, strong oxidizing agents and strong reducing agents.

**· Storage**

· **Requirements to be met by storerooms and receptacles:** Store in the original container.

· **Information about storage in one common storage facility:** Not required.

· **Further information about storage conditions:**

Keep receptacle tightly sealed.

Store in cool, dry conditions in well sealed receptacles.

· **Specific end use(s):** No further relevant information available.

**\* 8 Exposure Controls/Personal Protection**

· **Additional information about design of technical systems:**

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Mechanical exhaust may be needed. Because of the potential for reaction with water or moist air, stringent control measures such as isolation or enclosure of operations involving this material may be necessary.

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· **Control parameters:**

All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use local exhaust at filling zones and where leakage and dust formation is probable. Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below TLV & PEL limits.

· **Components with occupational exposure limits:**

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit.

At this time, the other constituents have no known exposure limits.

<b>1317-95-9 Silica</b>	
PEL	Long-term value: 0.05* mg/m <sup>3</sup> *resp. dust; 30mg/m <sup>3</sup> /%SiO <sub>2</sub> +2
REL	Long-term value: 0.05* mg/m <sup>3</sup> *respirable dust; See Pocket Guide App. A
TLV	TLV withdrawn
<b>1344-28-1 Aluminium Oxide</b>	
PEL	Long-term value: 15*; 5** mg/m <sup>3</sup> *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m <sup>3</sup> as Al; *as respirable fraction
<b>7440-03-1 Niobium</b>	
TWA	Long-term value: 6
<b>7440-39-3 Barium</b>	
PEL	Long-term value: 0.5 mg/m <sup>3</sup> as Ba
REL	Long-term value: 0.5 mg/m <sup>3</sup> as Ba
TLV	Long-term value: 0.5 mg/m <sup>3</sup> as Ba
<b>7440-67-7 Zirconium</b>	
PEL	Long-term value: 5 mg/m <sup>3</sup> as Zr
REL	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 5 mg/m <sup>3</sup> as Zr
TLV	Short-term value: 10 mg/m <sup>3</sup> Long-term value: 5 mg/m <sup>3</sup> as Zr
<b>7439-96-5 Manganese</b>	
PEL	Ceiling limit value: 5 mg/m <sup>3</sup> as Mn
REL	Short-term value: 3 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> fume, as Mn
TLV	Long-term value: 0.02* 0.1** mg/m <sup>3</sup> as Mn; *respirable **inhalable fraction

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<b>7440-21-3 Silicon</b>	
PEL	Long-term value: 15* 5** mg/m <sup>3</sup> *total dust **respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> *total dust **respirable fraction
TLV	TLV withdrawn
<b>7429-90-5 Aluminium</b>	
PEL	Long-term value: 15*; 5** mg/m <sup>3</sup> *Total dust; ** Respirable fraction
REL	Long-term value: 10* 5** mg/m <sup>3</sup> as Al*Total dust**Respirable/pyro powd./welding f.
TLV	Long-term value: 1* mg/m <sup>3</sup> as Al; *as respirable fraction
<b>7440-02-0 Nickel</b>	
PEL	Long-term value: 1 mg/m <sup>3</sup>
REL	Long-term value: 0.015 mg/m <sup>3</sup> as Ni; See Pocket Guide App. A
TLV	Long-term value: 1.5* mg/m <sup>3</sup> elemental, *inhalable fraction
<b>13463-67-7 Titanium Dioxide</b>	
PEL	Long-term value: 15* mg/m <sup>3</sup> *total dust
REL	See Pocket Guide App. A
TLV	Long-term value: 10 mg/m <sup>3</sup>

· **Additional information:** The lists that were valid during the creation of this SDS were used as basis.

· **Exposure controls:**

· **Personal protective equipment**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing and wash before reuse.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

· **Breathing equipment:**



Suitable respiratory protective device recommended.

Use NIOSH approved or equivalent fume respirator or air supplied respirator when welding, brazing, cutting, grinding, or soldering in a confined space or general work area where local exhaust and/or ventilation does not keep exposure below the limits outlined in Section 8. Monitor the air quality inside the welder's helmet, and/or worker's breathing zone to determine if a respirator is required and the type needed.

· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

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Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Select glove material based on penetration times, rates of diffusion and degradation.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material:**

The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.

· **Eye protection:**



Goggles with face-shield

Wear a helmet or face shield with a filter lens around shade number 14. Adjust if needed by selecting the next lighter or darker shade number. See ANSI/ASC Z49.1 Section 4.2 or publication F2.2. Shield other workers by providing screens and flash goggles.

· **Body protection:**



Protective work clothing

Wear approved head, hand, and body protection, which help to prevent injury from radiation, sparks, and electrical shock. This would include wearing welder's gloves and a protective face shield and may include arm protectors, apron, hats, shoulder protection, as well as dark, non-synthetic, substantial clothing. See ANSI Z49.1. Welders should be trained not to allow electrically live parts to contact the skin or wet clothing and gloves. The welders should insulate themselves from the work and ground and should not touch live electrical parts. Welders should not wear short sleeve shirts or short pants.

· **Limitation and supervision of exposure into the environment:** None

## \* 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

· **Form:**

Metal Cored Wire/Rod or Solid Wire/Rod

· **Color:**

Copper or silver/gray metallic color

· **Odor:**

Odorless until used

· **Odor threshold:**

Not determined.

· **pH-value:**

Not applicable.

· **Change in condition**

· **Melting point/Melting range:**

Not determined.

· **Boiling point/Boiling range:**

Not determined.

· **Flash point:**

None

· **Flammability (solid, gaseous):**

Not determined.

· **Ignition temperature:**

Not applicable

· **Decomposition temperature:**

Not determined.

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- **Auto igniting:** Product is not self-igniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower:** Not determined.
  - Upper:** Not determined.
- **Vapor pressure:** Not applicable.
- **Density:**
  - Relative density:** Not determined.
  - Vapor density:** Not applicable.
  - Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
  - Water:** Insoluble.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic:** Not applicable.
  - Kinematic:** Not applicable.
- **Solvent content:**
  - VOC content:** 0.00 %
  - Solids content:** 100.0 %
- **Other information:** No further relevant information available.

**10 Stability and Reactivity**

- **Reactivity:** Stable under normal conditions.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** Contact with acids or strong bases may cause generation of gas.
- **Conditions to avoid:** No further relevant information available.
- **Incompatible materials:** Strong acids, strong bases, strong oxidizing agents and strong reducing agents.
- **Hazardous decomposition products:**

Welding fumes and gases cannot be classified simply. The composition and quantity of both are dependent upon the metal being welded, the processes and procedures followed, and the welding consumables used. Other conditions that also influence the composition and quantity of fumes and gases to which workers may be exposed include: coatings on the metal being welded (such as paint, plating, or galvanizing), the number of welders in operation and the volume of the work area, the quality and amount of ventilation, the position of the welder's head with respect to the fume plume, and the presence of contaminants in the atmosphere (such as chlorinated hydrocarbon vapors from cleaning and degreasing procedures). When the electrode is consumed, the fume and gas decomposition products generated are different in percent and form from the ingredients listed in Section 8. Fume and gas decomposition, and not the ingredients in the electrode, are important. The concentration of a given fume or gas component may decrease or increase by many times the original concentration. Also, new compounds not in the electrodes may form. The known gases and fumes that may form during welding or cutting and their exposure limits are noted in the list in Section 11 below. Decomposition products of normal operation include those originating from the volatilization, reaction, or oxidation of the materials shown in Section 8, plus those from the base metal and coating, etc. as noted above. Chlorinated solvents may be decomposed into toxic gases such as phosgene.

It is understood, however, that the elements and/or oxides to be mentioned are virtually always present as complex oxides and not as metals (See "Characterization of Arc Welding Fume", from the American Welding Society). The elements or oxides listed Section 8 correspond to the ACGIH categories found in "Threshold Limit Values for Chemical Substances and Physical Agents" listed in Section 8. Some products will also contain: iron, manganese, silicon, aluminum, nickel, niobium, magnesium, molybdenum, titanium, vanadium,

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barium, lithium, zirconium, carbon, copper, and fluorides. Some elements or compounds may exceed their PELs/TLVs before the total fumes exceed 5 mg/m<sup>3</sup>.

**Additional information:**

Niobium metal is rapidly dissolved by hydrofluoric acid or hydrofluoric-nitric acid mixtures. Niobium ignites in cold fluorine and above 200°C will react exothermically with chlorine, bromine and halocarbons such as carbon tetrachloride, carbon tetra fluoride and Freon's.

## \*11 Toxicological Information

**Information on toxicological effects:**

Effects of Over-Exposure: Electric arc welding may create one or more of the following health hazards:

- ARC RAYS can injure eyes and burn skin. Incidences of skin cancer have been reported.
- ELECTRIC SHOCK can kill.
- FUMES AND GASES GENERATED FROM WELDING can be dangerous to your health.
- PRIMARY ROUTES OF ENTRY are the respiratory system, eyes, skin, and/or indigestion.
- NOISE can damage hearing.

Short-term (acute) over-exposure effects:

- WELDING FUMES may result in discomfort, such as dizziness, nausea, or dryness or irritation of the nose, throat, or eyes.
- ALUMINUM OXIDE may cause irritation of the respiratory system.
- IRON, IRON OXIDE have no known effects. Treat as a nuisance dust or fume.
- FLUORIDES, FLUORIDE COMPOUNDS may cause skin and eye burns, pulmonary edema, and bronchitis.
- MAGNESIUM, MAGNESIUM OXIDE overexposure may cause metal fume fever, characterized by metallic taste, tightness of chest, and fever. Symptoms may last 24-48 hours following overexposure.
- MANGANESE, MANGANESE COMPOUNDS may cause metal fume fever, characterized by irritation of the throat, vomiting, nausea, fever, body aches, and chills. Recovery is generally complete within 48 hours of overexposure.
- MOLYBDENUM may cause irritation of the eyes, nose, and throat.
- NICKEL, NICKEL COMPOUNDS may cause metallic taste, nausea, tightness in chest, fever, and allergic reactions.
- SILICA (amorphous) dust and fumes may cause irritation of the respiratory system, skin, and eyes.
- COPPER may cause capillary damage, headache, cold sweat, weak pulse, and kidney and liver damage, central nervous system excitation followed by depression, jaundice, convulsions, paralysis, and coma. Death may occur from shock or renal failure.
- TITANIUM DIOXIDE may cause irritation of the respiratory system.

Long-term (chronic) over-exposure effects:

- WELDING FUMES in excess levels may cause bronchial asthma, lung fibrosis, pneumoconiosis, or 'siderosis.' Overexposure to air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest x-rays. The severity of the change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work factors such as smoking, etc.
- ALUMINUM OXIDE may cause pulmonary fibrosis and emphysema.
- IRON, IRON OXIDE may cause siderosis or deposits of iron in the lungs, which is believed to affect pulmonary function. Lungs will clear in time when exposure to iron fumes and its compounds ceases. Iron and magnetite (Fe<sub>3</sub>O<sub>4</sub>) are not regarded as fibrogenic materials.
- MANGANESE, MANGANESE COMPOUNDS may cause central nervous system effects referred to as 'manganism.' Symptoms include languor, sleepiness, muscular weakness, emotional disturbances, spastic gait, and tremors. Behavioral changes and changes in handwriting may also appear. These effects are irreversible. Employees overexposed to manganese should receive regular medical examinations for early detection of manganism.
- MOLYBDENUM prolonged overexposure may result in loss of appetite, weight loss, loss of muscle coordination, difficulty in breathing, and anemia.

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- FLUORIDES may cause serious bone erosion (osteoporosis) and mottling of teeth.
- NICKEL, NICKEL COMPOUNDS may lung fibrosis or pneumoconiosis. Studies of nickel refinery workers indicated a higher incidence of lung and nasal cancers.
- SILICA (respirable crystalline silica) overexposure may result in silicosis. Respirable crystalline silica is a known human carcinogen. SILICA (amorphous) long term overexposure may cause pneumoconiosis. Noncrystalline forms of silica (amorphous silica) are considered to have little fibrotic potential.
- COPPER may cause hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has led to hemolytic anemia and accelerates arteriosclerosis.
- TITANIUM DIOXIDE may cause pulmonary irritation and slight fibrosis.

· **Acute toxicity:**

· <b>LD/LC50 values that are relevant for classification:</b>		
<b>7439-89-6 Iron</b>		
Oral	LD50	7,500 mg/kg (Rat)
<b>1344-28-1 Aluminium Oxide</b>		
Oral	LD50	>10,000 mg/kg (Rat)
Inhalative	LC50/4 h	>2.6 mg/l (Rat)
<b>7439-93-2 Lithium</b>		
Inhalative	LC50/4 h	18 mg/l (Trout)
	LC50/96 hours	62.21 mg/l (Trout)
<b>7440-03-1 Niobium</b>		
Oral	Toxic Dose Low	>10,000,000 µg/kg (Mouse)
		>10,000,000 µg/kg (Rat)
<b>7439-96-5 Manganese</b>		
Oral	LD50	9,000 mg/kg (Rat)
<b>7440-21-3 Silicon</b>		
Oral	LD50	3,160 mg/kg (Rat)
<b>7429-90-5 Aluminium</b>		
Oral	LD50	>2,000 mg/kg (Rat)
Inhalative	LC50/4 h	888 mg/l (Rat)
<b>13463-67-7 Titanium Dioxide</b>		
Oral	LD50	>10,000 mg/kg (Rat)
Dermal	LD50	>10,000 mg/kg (Rabbit)
Inhalative	LC50/4 h	>6.82 mg/l (Rat)

· **Primary irritant effect:**

· **On the skin:**

- Irritant to skin and mucous membranes.
- May cause an allergic skin reaction.

· **On the eye:**

- Irritating effect.
- Causes serious eye irritation.

· **Sensitization:** Sensitization possible through skin contact.

· **Additional toxicological information:**

- The product shows the following dangers according to internally approved calculation methods for preparations:
- Irritant

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**Trade Name: Carbon Steel Electrodes for Submerged Arc Welding**· **Carcinogenic categories:**· **IARC (International Agency for Research on Cancer):**

(a) Although IARC has classified titanium dioxide as possible carcinogenic to human (2B), their summary concludes: "No significant exposure to titanium dioxide is thought to occur during the use of products which titanium dioxide is bound to other materials, such as in cosmetics or in paints."

(b) OSHA does not regulate Titanium Dioxide as a carcinogen. However, under 29 CFR 1910.1200 the SDS must convey the fact that Titanium Dioxide is a potential carcinogen to rats.

Group 1 - Carcinogenic to humans

Group 2A - Probably carcinogenic to humans

Group 2B - Possibly carcinogenic to humans

Group 3 - Not classifiable as to its carcinogenicity to humans

Group 4 - Probably not carcinogenic to humans

1317-95-9	Silica	1
7440-02-0	Nickel	2B
13463-67-7	Titanium Dioxide	2B

· **NTP (National Toxicology Program):**

7440-02-0	Nickel	R
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· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

**\*12 Ecological Information**· **Toxicity:**· **Aquatic toxicity:****7439-93-2 Lithium**

EC50 153.44 mg/l (Green algae)  
10 mg/l (Daphnia) (with pH-adjustment)

**7439-96-5 Manganese**

EC50 40 mg/l (Water flea)

**7440-02-0 Nickel**

EC50 1 mg/l (Water flea)

**13463-67-7 Titanium Dioxide**

EC50 &gt;1,000 mg/l (Water flea)

· **Persistence and degradability:** No further relevant information available.· **Behavior in environmental systems:**· **Bioaccumulative potential:** No further relevant information available.· **Mobility in soil:** No further relevant information available.· **Additional ecological information:**· **General notes:**

Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.

· **Results of PBT and vPvB assessment:**· **PBT:** Not applicable.· **vPvB:** Not applicable.· **Other adverse effects:** No further relevant information available.

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**Trade Name: Carbon Steel Electrodes for Submerged Arc Welding****13 Disposal Considerations**

- **Waste treatment methods**
- **Recommendation:**  
Must not be disposed of together with household garbage. Do not allow product to reach sewage system. Observe all federal, state and local environmental regulations when disposing of this material.
- **Uncleaned packaging**
- **Recommendation:** Disposal must be made according to official regulations.

**14 Transport Information**

- **UN-Number:**
- **DOT, ADR/ADN, ADN, IMDG, IATA** Non-Regulated Material
- **UN proper shipping name:**
- **DOT, ADR/ADN, ADN, IMDG, IATA** Non-Regulated Material
- **Transport hazard class(es):**
- **DOT, ADR/ADN, ADN, IMDG, IATA**
- **Class:** Non-Regulated Material
- **Packing group:**
- **DOT, ADR/ADN, IMDG, IATA** Non-Regulated Material
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
- **UN "Model Regulation":** Non-Regulated Material

**\*15 Regulatory Information**

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

7440-62-2	Vanadium
1344-28-1	Aluminium Oxide
7440-39-3	Barium
7439-96-5	Manganese
7429-90-5	Aluminium
7440-50-8	Copper
7440-02-0	Nickel

· **TSCA (Toxic Substances Control Act):**

7439-89-6	Iron	ACTIVE
7440-32-6	Titanium	ACTIVE
7440-62-2	Vanadium	ACTIVE
1344-28-1	Aluminium Oxide	ACTIVE
7439-93-2	Lithium	ACTIVE
7440-03-1	Niobium	ACTIVE
7440-39-3	Barium	ACTIVE

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7440-44-0	Carbon Fiber	ACTIVE
7440-67-7	Zirconium	ACTIVE
7439-96-5	Manganese	ACTIVE
7440-21-3	Silicon	ACTIVE
7439-95-4	Magnesium	ACTIVE
1317-61-9	Iron Oxide	ACTIVE
7429-90-5	Aluminium	ACTIVE
7440-50-8	Copper	ACTIVE
7439-98-7	Molybdenum	ACTIVE
7440-02-0	Nickel	ACTIVE
13463-67-7	Titanium Dioxide	ACTIVE

**· Hazardous Air Pollutants**

7439-96-5 Manganese

**· California Proposition 65:**

WARNING: This product can expose you to chemicals including the listed chemicals which are known to the State of California to cause cancer, birth defects and/or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**· Chemicals known to cause cancer:**

7440-02-0 Nickel

13463-67-7 Titanium Dioxide

**· Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

**· Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

**· Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

**· New Jersey Right-to-Know List:**

7440-32-6 Titanium

7440-62-2 Vanadium

1317-95-9 Silica

1344-28-1 Aluminium Oxide

7439-93-2 Lithium

7440-39-3 Barium

7440-67-7 Zirconium

7439-96-5 Manganese

7440-21-3 Silicon

7439-95-4 Magnesium

7429-90-5 Aluminium

7440-50-8 Copper

7439-98-7 Molybdenum

7440-02-0 Nickel

13463-67-7 Titanium Dioxide

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<b>· New Jersey Special Hazardous Substance List:</b>		
7440-32-6	Titanium	F3, R1
1317-95-9	Silica	CA
7439-93-2	Lithium	F2, R2
7440-39-3	Barium	F3, R2
7440-67-7	Zirconium	F4, R1
7439-96-5	Manganese	F3, R1
7440-21-3	Silicon	F3
7429-90-5	Aluminium	F3, R1
7440-02-0	Nickel	CA
<b>· Pennsylvania Right-to-Know List:</b>		
7440-62-2	Vanadium	
1317-95-9	Silica	
1344-28-1	Aluminium Oxide	
7439-93-2	Lithium	
7440-39-3	Barium	
7440-67-7	Zirconium	
7439-96-5	Manganese	
7440-21-3	Silicon	
7439-95-4	Magnesium	
7429-90-5	Aluminium	
7440-50-8	Copper	
7439-98-7	Molybdenum	
7440-02-0	Nickel	
13463-67-7	Titanium Dioxide	
<b>· Pennsylvania Special Hazardous Substance List:</b>		
7440-62-2	Vanadium	E
1344-28-1	Aluminium Oxide	E
7440-39-3	Barium	E
7439-96-5	Manganese	E
7429-90-5	Aluminium	E
7440-50-8	Copper	E
7440-02-0	Nickel	ES
<b>· Carcinogenic categories:</b>		
<b>· EPA (Environmental Protection Agency):</b>		
7440-39-3	Barium	D, CBD(inh), NL(oral)
7439-96-5	Manganese	D
7440-50-8	Copper	D
<b>· TLV (Threshold Limit Value established by ACGIH):</b>		
1317-95-9	Silica	A2
1344-28-1	Aluminium Oxide	A4
7440-39-3	Barium	A4

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7440-67-7	Zirconium	A4
7429-90-5	Aluminium	A4
7439-98-7	Molybdenum	A3
7440-02-0	Nickel	A5
13463-67-7	Titanium Dioxide	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

1317-95-9	Silica
7440-02-0	Nickel
13463-67-7	Titanium Dioxide

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms:**· **Signal word:** Danger· **Hazard-determining components of labeling:**

Iron  
Titanium  
Lithium  
Silica  
Nickel

· **Hazard statements:**

H315 Causes skin irritation.  
H318 Causes serious eye damage.  
H317 May cause an allergic skin reaction.  
H350 May cause cancer.  
H335 May cause respiratory irritation.

· **Precautionary statements:**

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P260 Do not breathe dust/fume/gas/mist/vapors/spray.  
P264 Wash thoroughly after handling.  
P271 Use only outdoors or in a well-ventilated area.  
P272 Contaminated work clothing must not be allowed out of the workplace.  
P280 Wear protective gloves / eye protection / face protection.  
P285 In case of inadequate ventilation wear respiratory protection.  
P302+P352 If on skin: Wash with plenty of water.  
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310 Immediately call a poison center/doctor.  
P308+P313 IF exposed or concerned: Get medical advice/attention.  
P321 Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).  
P312 Call a poison center/doctor if you feel unwell.  
P362+P364 Take off contaminated clothing and wash it before reuse.  
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.  
P363 Wash contaminated clothing before reuse.  
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

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P405 Store locked up.  
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**· National regulations:**

None of the ingredients are listed.

**· Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.**16 Other Information**

SOWESCO urges each end user and recipient of this SDS to study it carefully. If necessary, consult an industrial hygienist or other expert to understand this information and safeguard the environment and protect workers from potential hazards associated with the handling or use of this product. This information is believed to be accurate as of the revision date shown above. However, no warranty, expressed or implied, is given. Because the conditions or methods of use are beyond SOWESCO's control, we assume no liability resulting from the use of this product. Regulatory requirements are subject to change and may differ between various locations. Compliance with all applicable Federal, State, Provincial, and Local laws and regulations remain the responsibility of the user.

**· Date of last revision/ revision number:** 10/24/2019 / 1**· Abbreviations and acronyms:**

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road  
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways  
 IMDG: International Maritime Code for Dangerous Goods  
 DOT: US Department of Transportation  
 IATA: International Air Transport Association  
 ACGIH: American Conference of Governmental Industrial Hygienists  
 EINECS: European Inventory of Existing Commercial Chemical Substances  
 ELINCS: European List of Notified Chemical Substances  
 CAS: Chemical Abstracts Service (division of the American Chemical Society)  
 NFPA: National Fire Protection Association (USA)  
 HMIS: Hazardous Materials Identification System (USA)  
 VOC: Volatile Organic Compounds (USA, EU)  
 LC50: Lethal concentration, 50 percent  
 LD50: Lethal dose, 50 percent  
 PBT: Persistent, Bioaccumulative and Toxic  
 vPvB: very Persistent and very Bioaccumulative  
 NIOSH: National Institute for Occupational Safety and Health  
 OSHA: Occupational Safety & Health Administration  
 TLV: Threshold Limit Value  
 PEL: Permissible Exposure Limit  
 REL: Recommended Exposure Limit  
 Flam. Sol. 1: Flammable solids – Category 1  
 Flam. Sol. 2: Flammable solids – Category 2  
 Pyr. Sol. 1: Pyrophoric solids – Category 1  
 Water-react. 1: Substances and mixtures which in contact with water emit flammable gases – Category 1  
 Water-react. 2: Substances and mixtures which in contact with water emit flammable gases – Category 2  
 Acute Tox. 4: Acute toxicity – Category 4  
 Skin Corr. 1B: Skin corrosion/irritation – Category 1B  
 Skin Irrit. 2: Skin corrosion/irritation – Category 2  
 Eye Dam. 1: Serious eye damage/eye irritation – Category 1  
 Eye Irrit. 2B: Serious eye damage/eye irritation – Category 2B  
 Skin Sens. 1: Skin sensitisation – Category 1  
 Carc. 1A: Carcinogenicity – Category 1A  
 Carc. 2: Carcinogenicity – Category 2  
 STOT SE 3: Specific target organ toxicity (single exposure) – Category 3  
 STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1  
 Aquatic Acute 3: Hazardous to the aquatic environment - acute aquatic hazard – Category 3  
 Aquatic Chronic 4: Hazardous to the aquatic environment - long-term aquatic hazard – Category 4

**· \* Data compared to the previous version altered.**

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